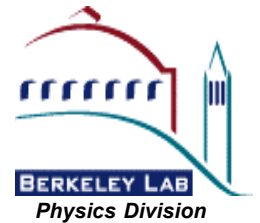


Neutrino Study Plans

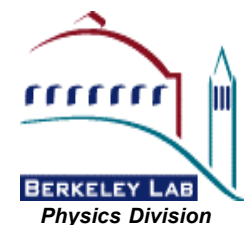


R.G. Stokstad

for the Neutrino Working Group

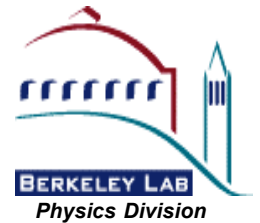
- Neutrino Science at LBNL
- Scientific Challenges
- Opportunities
- Charge to the Working Group
- Status

Neutrino Science at LBNL



Sudbury Neutrino Observatory	1989-	NSD
H.E. Neutrino Astronomy	1994-	PD/NSD
AMANDA/IceCube	1997-	PD/NSD
Neutrino Factory μ -Collider	1996-	AFRD
KamLAND	1999-	NSD/PD
CUORE	1999-	MSD/NSD

Scientific Challenges



(Neutrinos as fundamental particles)

Measure the mixing and the masses

Complete the solar ν study (is it the LMA?)

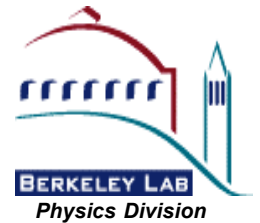
How small is $\sin^2(2\theta_{13})$?

Can CP violation be observed?

Mass hierarchy? Absolute mass scale?

Dirac or Majorana? What about LSND?

Scientific Challenges



(Neutrinos as messengers)

Map the neutrino sky

point sources?

diffuse flux?

unique events?

gamma-ray busters

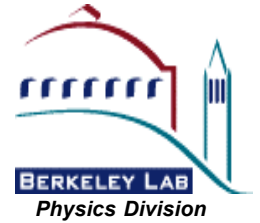
supernovae

Origin of high energy cosmic rays

Decay of WIMPS

Some Opportunities

(i.e., beyond present commitments)



Next Generation Solar γ experiment

Double Beta Decay

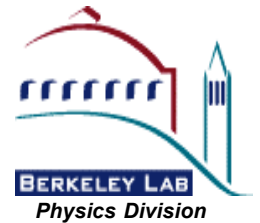
Long Base Line experiment

Muon cooling demonstration experiment

National Underground Science Laboratory

(Not prioritized)

Charge

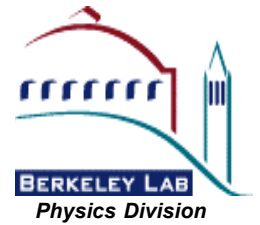


- ...survey the theoretical landscape and recent experimental results.
- ...most compelling next set of neutrino experiments world-wide.
- ...survey ongoing and planned neutrino-related work at LBNL.
- ...place in context through discussion with the proponents.
- ...present theoretical context, ongoing program, future options
- ...lay the groundwork for development of proposals
(both LDRD and external) for support of our work.

Neutrino Working Group

R. Cahn (PD), W. Carithers (PD), S. Freedman (NSD)
K. Heeger (PD), R. Kadel (PD), V. Koch (NSD), K. Lesko (NSD)
Z. Ligeti (PD), deputy, K-B. Luk (PD), H. Murayama (PD)
E. Norman (NSD), D. Nygren (PD), A. Sessler (AFRD)
R. Stokstad (NSD), chair J. Wurtele (AFRD), M. Zisman (AFRD)

Status



Began work in September

Information gathering well along

Consider resources as well as science

Funding, manpower - local interest and expertise

Some things we would like to know

KamLAND result ? (December ?)

The FY04 Budget Submission? (January)

Report time frame Dec <--> March

Exciting opportunities in a rapidly developing field - choices may be difficult